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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/859,581	05/18/2001	Spencer Greene	0023-0008	3550

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EXAMINER
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SEDIGHIAN, REZA

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/859,581

**Applicant(s)**

GREENE, SPENCER

**Examiner**

M. R. Sedighian

**Art Unit**

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12/09/04.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-11,13-15,17-20,22-26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22,23,26 and 28 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7-10,13-15,17,24,25,29 and 30 is/are rejected.
- 7) ☒ Claim(s) 5,6,11 and 18-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/1/04</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 2633

1. This communication is responsive to applicant's 12/09/04 amendments in the application of Spencer Greene filed 5/18/01. The amendments have been entered. Claims 1-2, 4-11, 13-15, 17-20, 22-26, and 28-30 are now pending.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 4, 10, 13, and 17, are rejected under 35 U.S.C. 102(e) as being anticipated by Aso et al. (US Patent Application Publication 2001/0007509 A1).

Regarding claims 1 and 13, Aso teaches a wavelength division multiplexer (fig. 20 and fig. 24) for multiplexing optical input signals (Page 9, paragraph 0092), comprising: a plurality of wavelength converters (10, 20, figs. 20, 24) receiving optical input signals with a common wavelength (Page 9, paragraph 0092, note that the WDM light waves inputted to divider 40 are routed to wavelength converters 10 and 20, and accordingly each converter 10 and 20 receives the same common wavelengths from divider 40, for example  $\lambda_1$  is common to both converter 10 and 20) and different optical pump signals (Page 8, paragraph 0084 and  $\lambda_{P1}$ ,  $\lambda_{P2}$  and 2, 21, fig. 20) and outputting output signals with wavelengths that are differently shifted relative to the common wavelength of the optical input signals (Page 6, paragraphs 0067 and Page 9, paragraph 0093), and a coupler (27, fig. 20 and 41, fig. 24) combining the output signals from the wavelength converters into a multiplexed signal (Page 9, paragraph 0092, 0094).

Regarding claim 2, Aso teaches each of the converters receive different input signals (note that each wavelength converter 10 and 20 receives different input light signals of wavelengths  $\lambda_1, \lambda_2, \dots, \lambda_Y$ ), and outputs one of the output signals to the coupler (27, fig. 20 and 41, fig. 24).

Regarding claims 4 and 17, Aso teaches n input optical signals (Page 9, paragraph 0092) passing through a unique set of converters (10, 20, figs 20, 24).

Regarding claim 10, Aso teaches a plurality of pump lasers (2, 21, fig. 20) being connected to the converters (10, 20, fig. 20) and outputting an optical pump signal having a unique wavelength (Page 8, paragraph 0084 and  $\lambda_{P1}, \lambda_{P2}$ ).

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 7-8, 14, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aso et al. (US Patent Application Publication 2001/0007509 A1) in view of Bartholomew (US Patent No: 4,885,460).

Regarding claims 7-8, 14, and 25, Aso differs from the claimed invention in that Aso does not disclose the wavelength converter includes a nonlinear crystal to receive the input signal and the pump signal and to shift the wavelength of the input signal to further produce an intermediate signal, and a filter that is connected to the output of the nonlinear crystal to filter the unwanted signal. Bartholomew teaches an optical converter (10, fig. 1) for converting an optical

Art Unit: 2633

input signal (fs, fig. 1) based on a pump signal (fp, fig. 1) and that is connected to a filter (12, fig. 1) for filtering unwanted signals (col. 1, lines 34-41). Therefore, it would have been obvious to an artisan at the time of invention to incorporate a wavelength converter that is comprised of a nonlinear crystal and a filter such as the one of Bartholomew for the wavelength converters in the optical transmission system of Aso in order to provide a high wavelength conversion efficiency and to eliminate the unwanted signals.

6. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aso et al. (US Patent Application Publication 2001/0007509 A1) in view of Suzuki (US Patent No: 6,324,318).

Regarding claims 9 and 15, Aso differs from the claimed invention in that Aso does not disclose an amplifier connected to the coupler to amplify the multiplexed signal. Suzuki teaches multiplexed optical signals (14, fig. 2) are amplified (15, fig. 2). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate an optical amplifier such as the one of Suzuki for the optical transmission and multiplex system of Aso in order to amplify and boost the signal strength of converted multiplexed optical signal to further increase the transmission distance.

7. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aso et al. (US Patent Application Publication 2001/0007509 A1) in view of Alexander et al. (US Patent No: 5,715,076).

Regarding claim 29, Aso teaches  $n$  wavelength converters (10, 20, figs. 20, 24) each being configured to receive one of  $n$  optical input signals (each converter 10 and 20 receives the light signals  $\lambda_1, \lambda_2, \dots, \lambda_Y$ ) having a common wavelength (for example each converter 10 and 20 respectively receives a common wavelength such as  $\lambda_1$ ) and an optical pump signal ( $\lambda_{P1}, \lambda_{P2}$ ) and generating output signals that are shifted relative to the common wavelength by a different amount (Page 9, paragraph 0093), and a coupler to combine the optical signal (27, fig. 20), and an optical fiber to carry the combined optical signal (the fiber that is connected to couplers 27 or 41). Aso differs from the claimed invention in that Aso does not disclose a splitter to receive the combined signal and producing  $n$  output signal. However, it is well known in the art to incorporate an optical splitter along a fiber line to further divide the signal for further signal transmission. Alexander teaches an optical splitter (90, fig. 1) along a fiber line (60, fig. 1) to further divide a multiplexed signal (the WDM signal, fig. 1) for further transmission. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate an optical splitter such as the one of Alexander along the transmission fiber in the optical transmission system of Aso in order to split the wavelength converted signals for further signal transmission, processing, or measurements.

7. Claims 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aso et al. (US Patent Application Publication 2001/0007509 A1).

Regarding claims 24 and 30, Aso teaches an optical signal transmission and wavelength conversion, as discussed above in claim 1. Aso differs from claims 24 and 30 in that Aso does not specifically disclose the transmission of  $n$  optical input signals from one or more network

Art Unit: 2633

devices such as routers, and receiving the converted signal by one or more devices such as routers. However, it would have been obvious to a person of ordinary skill in the art at the time of invention that the WDM signal light entering coupler 40 can be transmitted from one or more network devices, and the combined wavelength converted light waves signals outputted by combiner 41 can be further transmitted to other network devices such as routers or switches in order to transmit a plurality of different light waves signals to different destinations. Claims 24 and 30 further requires similar limitation as recited in claim 1 above.

8. Claims 5-6, 11, and 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 22-23, 26, and 28 are allowed over prior art of record.

10. Applicant's arguments with respect to claims 1, 13, 22, 24, 25, 26, 28, 29, and 30 have been considered but are moot in view of the new ground(s) of rejection.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2633

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
**M. R. SEDIGHIAN**  
**PRIMARY EXAMINER**